INDEX

Acidity, effect of organic matter on, 133-144 Acidity, soil, nature and cause of, 156-121 Adsorption, interference of, in soil treatment for *Popillia japonica*, 50-56

African soils, South, nitrification in, 301-363
Alfalfa, nitrogen in tops and roots of, in relation to growth conditions, 383-389, 396-399

Alkali Soils, The Solubility of Anions in (paper), W. P. Kelley and S. M. Brown, 261-285

carbon dioxide in compressed air filtration, 263

effect of ratio of soil to water, 266-273 effect of time on solubility, 263-265 introduction, 261-262 methods, 262

rate of solution of anions, 273–283 summary, 284

Aluminum hydrate, use of, to decolorize soil solutions, 413-417

Ammonification, effect of -

organic decomposition on, 135-136, 145-147 soil solution concentration on, 173-176 straw on, 242.

Anions, solubility of, in alkali soils, 261–285 Arid and semi-arid soils, nitrification in, 301–

Asparagus, effect of common rock salt on, 449-455

Bacteria, soil, effect of straw on, 233-259 Bacterial activity, effect of organic matter on, 133-144, 145-162

Barium phosphate as a source of phosphoric acid, 192

Bauer, F. C. (paper), The Relation of Organic Matter and the Feeding Power of Plants to the Utilization of Rock Phosphate; see Rock Phosphate, Utilization of, etc., 21-41

Beans, effect of borax upon growth of, 96-103 Beckwith, Charles S. (paper), The Effect of Fertilizer Treatments on Savannah Cranberry Land; see, Cranberry Land, etc., 183-196

Biological Soil Processes, The Effect of Straw on (paper), T. J. Murray, 233-259

discussion, 235

experimental, 235-258

historical, 234

introduction, 233 outline, 235

summary and conclusion, 258

Blair, A. W., Lipman, J. G., and (paper), Nitrogen Losses Under Intensive Cropping, 1-19.

Blair, A. W., Lipman, J. G., Prince, A. L., and (paper), The Influence of Varying Amounts of Sulfur in the Soil on Crop Yields, Hydrogen-ion Concentration, Lime Requirement and Nitrate Formation; see, Sulfur in the Soil, etc., 197-207

Borax, Effects upon the Growth of Potatoes, Corn, and Beans Resulting from the Addition of, to the Fertilizer Used (paper), J. R. Neller and W. J. Morse, 79-121

effect of-

borax upon beans, 96-103 borax upon corn, 91-96 borax upon potatoes, 84-91 method of application, 85-86, 96, 103 lime, gypsum, and manure upon borax influence, 89, 95, 102

soil moisture upon borax influence, 104 experimental procedure, 82

introduction, 79

scope of experiment, 81 summary, 103-104

Brown, P. E., and Stallings, J. H. (paper), Inoculated Legumes as Nitrogenous Fertilizers; see, Legumes, Inoculated, etc., 365-407 Brown, S. M., Kelley, W. P., and (paper), The Solubility of Anions in Alkali Soils; see Alkali Soils, etc., 261-285

Buffer action of nutrient solutions, 74-76 Buffering, effect of organic matter on, 153-156

Calcium cyanamid as a source of nitrogen, 189-190

Carbon content, effect of intensive cropping on, 14-15

Carbon dioxide in compressed air used for filtrations, effect of, 263

Carbon-nitrogen Ratio, Practical Significance of, in Soils (paper), J. W. Reed, 491-495

experimental, 493 historical, 491-493

summary, 493

Carbonates, residual, influence of organic decomposition on, 141-142 150-151

Chlorosis, relation of hydrogen-ion concentration of nutrient solution to, 69-77

Clover, nutrient requirements of, in solution cultures, 287-299

Colorimetric determination of soil nitrates in a colored water extract, 413-417

Composition of soil solution, method of studying, 209-232

Corn, effect of borax upon growth of, 91-96 Cowpeas, nitrification of, 327

Cranberry Land, The Effect of Fertilizer Treatments on Savannah (paper), Charles S. Beckwith, 183–196

amount and sources of nitrogen, 188–189 barium phosphate, 192

calcium cyanamide, 189-190 cranberry culture, 183-184

cranberry culture, 183-18 cranberry soils, 184

disadvantages of fertilization, 195

effect of plant-food, 185-188 effects other than yield, 194-195

methods used, 184-185

optimum amount of fertilizer, 192-193 summary, 195

Cranberry soils, types of, 184

Cultivation of semi-arid soils, effect of, on nitrification, 320-332

Displacement method of studying soil solution, 211-221

Dried blood for cranberries, 185-188

Emerson, Paul (paper), The Colorimetric Determination of Soil Nitrates in a Colored Water Extract; see, Nitrates, soil, etc., 413-417

Erdman, L. W. (paper), The Effect of Gypsum on Soil Reaction; see, Gypsum, the effect of, etc., 433-448.

Fertilizers -

absorption of, by clover and wheat in solution cultures, 291-295

common rock salt, 471-474

effect of borax in, 79-151

effect of method of application of, 85-86, 96, 103

for cranberries, 183-196

nitrification of ten, 343-347

nitrogenous, inoculated legumes as, 365-407

requirements of clover and wheat in solution cultures, 287-299

Filtering soil extracts, effect of compressed air in, 263

Fixation of nitrogen by legumes-

quasi individual plant records of, 365-407 under various growth conditions, 365-407

Freezing point, depression of, 224-229

Freezing-point method of studying soil solution, 221-229

Fusions for potash determinations, use of silica crucibles in, 419-432

Greaves, J. E. and Lund, Yeppa (paper), The Rôle of Osmotic Pressure in the Toxicity of Soluble Salts; see, Toxicity of Soluble Salts, etc., 163-181

Gypsum effect of, upon borax fertilizers, 89, 95, 102 The Effect of, on Soil Reaction (paper),

L. W. Erdman, 433-448 conclusions, 446-447 comparison of results, 446 experimental, 435 historical, 433-435 introduction, 433

Haag, J. R., McCall, A. G., and (paper), The Relation of the Hydrogen-ion Concentration of Nutrient Solutions to Growth and Chlorosis of Wheat Plants; see Hydrogen-ion Concentration of Nutrient, etc., 69-77 Hall, Thomas D. (paper), Nitrification in Some South African Soils, 301-363

Hydrogen-ion concentration compared with lime requirement, 201-203 effect of organic matter on, 151-152

effect of sulfur on, 199-201

hydrogen-electrode method, effect of gypsum on, 433-448

of Nutrient Solutions, The Relation of, to Growth and Chlorosis of Wheat Plants (paper), A. G. McCall and J. R. Haag, 69-77

buffer action of nutrient solutions, 74-76 chlorosis, 73-74

data and discussion, 70

growth, 72-73 introduction, 69

introduction, 69

plan of experiment, 70 summary, 76

Hydroxyl-ion concentration, in extracts of alkali soils, 271-273

Inoculated legumes as nitrogenous fertilizers, 365–407

Inoculation, effect of, on nitrogen content of legumes, 365-407

Invisible germs, possible existence of, in the soil, 409-412

Intensive cropping, nitrogen losses under, 1-19

Japanese Beetle Larvae-

Experiments in the Treatments of Balled
Earth about the Roots of Coniferous
Plants for the Control of (paper), B. R.
Leach and J. W. Thompson, 43-61
basis of experimental work, 44
classes of compounds employed, 44
dipping tests, 45-56
dosage tests, 56
experimental procedure, 44-45
introduction, 43
nursery shipping practice, 43
possibility of infestation, 44
summary, 58

Experiments with Hot Water in the Treatment of Balled Earth about the Roots of Plants for the Control of (paper), B. R. Leach, 63-68 analysis of results, 67 basis of experimental work, 63 dipping tests, 64 experimental procedure, 64 experiments with grubs in soil, 65 experimental work, 63 introduction, 63 nursery shipping practice, 63 summary and conclusions, 67 treatment of plants with hot water, 66–67

Joffe, J. S., Lipman, J. G., Waksman, S. A., and (paper), The Oxidation of Sulfur by Soil Microörganisms: I; see, Sulfur, The Oxidation of, etc., 475-489.

Jones, J. S., and Reeder, J. C. (paper), The Use of Silica Crucibles for the Determination of Potassium in Soils, 419-432.

Kelley, W. P., and Brown, S. M. (paper), The Solubility of Anions in Alkali Soils; see, Alkali Soils, etc., 261-285.

Leach, B. R .-

(paper), Experiments with Hot Water in the Treatment of Balled Earth about the Roots of Plants for the Control of Japanese Beetle Larvae; see, Japanese Beetle Larvae, etc.. 63-68.

and Thompson, J. W. (paper), Experiments in the Treatment of Balled Earth about the Roots of Coniferous Plants for the Control of Japanese Beetle Larvae; see, Japanese Beetle Larvae, etc., 43-61.

Legumes, Inoculated, as Nitrogenous Fertilizers (paper), P. E. Brown and J. H. Stallings, 365-407

discussion, 399-405

experimental, 375-399

historical, 367-374

introduction, 365-367

summary, 405

Legumes, nitrogen content of, under various growth conditions, 365-407

Leguminous green manures, effect of, on nitrogen in soil, 7-14

Lime, effect of, on-

ammonification, 137, 146

borax fertilizers, 89, 95, 102

nitrification, 138, 147-148, 332-341

soluble non-protein nitrogen, 143

Lime requirement compared with hydrogenion concentration, 201-203

Lime requirement, effect of-

gypsum on, 433-448

organic decomposition on, 138-141, 148-150

sulfur on, 201-203

Lipman, J. G .-

and Blair, A. W. (paper), Nitrogen losses under intensive cropping, 1-19

Blair, A. W., and Prince, A. L. (paper), The Influence of Varying Amounts of Sulfur in the Soil on Crop Yields, Hydrogen-ion Concentration, Lime Requirement and Nitrate Formation; see, Sulfur in the Soil, etc., 197-207

Waksman, S. A., and Joffe, J. S. (paper), The Oxidation of Sulfur by Soil Microörganisms: I; see, Sulfur, The Oxidation of, etc., 475-489

Lund, Yeppa, Greaves, J. E., and (paper), The Rôle of Osmotic Pressure in the Toxicity of Soluble Salts; see, Toxicity of Soluble Salts, etc., 163-181

McCall, A. G., and Haag, J. R. (paper), The Relation of the Hydrogen-ion Concentration of Nutrient Solutions to Growth and Chlorosis of Wheat Plants; see Hydrogen-ion Concentration of Nutrient, etc., 69-77

Manure, effect of, upon borax fertilizers, 89, 95, 102

Microbiology of the Soil, Preliminary Note on the, and the Possible Existence therein of Invisible Germs (paper), Giacomo Rossi, 409-412

Microörganisms of the soil, oxidation of sulfur by, 475-489

Moisture, effect of, in borax-fertilized soils, 104

Morse, W. J., Neller, J. R., and (paper), Effects upon the Growth of Potatoes, Corn, and Beans Resulting from the Addition of Borax to the Fertilizer Used; see Borax, Effects upon, etc., 79-121

Muriate of potash for cranberries, 185-188 Murray, T. J. (paper), The Effect of Straw on Biological Soil Processes, 233-259

Neller, J. R., and Morse, W. J. (paper), Effects upon the Growth of Potatoes, Corn, and Beans Resulting from the Addition of Borax to the Fertilizer Used; see Borax, Effects upon, etc., 79-121

Nitrate of soda for cranberries, 185-188

Nitrates, Soil-

effect of-

hydrogen-ion concentration on, 207 straw on, 240-241

sulfur in soil on, 203-206 The Colorometric Determinat

The Colorometric Determination of, in a Colored Water Extract (paper), Paul Emerson, 413-417

Nitrification-

at varying depths of soil, 339-341 effect of—

cultivation of semi-arid soils on, 320-332 lime on, 332-341

organic decomposition on, 137-138, 147-148

seasonal variation on, 310–320 soil solution concentration on, 176–178 straw on, 235–240

in arid and semi-arid soils, 301-363

in Some South African Soils (paper), Thomas D. Hall, 301-363 cultivated and uncultivated soils, 320-332

effect of lime, 332-341 experimental procedure, 306 final discussion and conclusion, 360-361

introduction, 301-302 method of sampling, 307

nitrates at successive depths, 335-339 nitrifiability of ten fertilizers, 343-347 nitrifying power at successive depths, 339-341

nitrifying power of various soils, 347–360 object of investigation, 302 outline and scope of work, 305–306 preliminary studies, 307–310 review of previous work, 302–305 seasonal variation, 310–320 whale manure, 342–343

of-

cowpeas, 327, 327 ten nitrogenous fertilizers, 343–347 whale manure, 342–343

Nitrogen atmospheric, effect of straw on, 243,

content—
effect of intensive cropping on, 12-14
of alfalfa, 383-389, 396-399
of clover, 375-382, 389-396

Losses under Intensive Cropping (paper), J. G. Lipman and A. W. Blair, 1-19 carbon content of cylinder soils, 14-15 introduction, 1-4 loss for first ten years, 4-7 loss for second ten years, 7-12 percentage of nitrogen in soils, 12-14 summary, 15-16

total, effect of straw on, 233-259

Nitrogenous fertilizers, inoculated legumes as, 365-407

Nutrient Requirements of Clover and Wheat in Solution Cultures (paper), J. J. Skinner and F. R. Reid, 287-299

conclusions, 296 fertilizer ratio and clover growth, 288-291 growth and absorption, 291-295

introduction, 287-288 Nutrient solutions-

buffer action of, 69-77

hydrogen-ion concentration of, 69-77

Organic carbon-nitrogen ratio in oils, 491-

Organic matter, effect of-

extracts of, on solubility of rock phosphate, 27-29

on acidity and bacterial activity, 133-144, 145-162

on availability of rock phosphateunder influence of growing plants, 29-32 under influence of moving capillary water, 26-27 with leaching, 25-26

without leaching, 23-25

Osmotic pressure, relation of, to toxicity, 163-181

Oxidation of sulfur by soil microörganisms, 475-489

Parker, F. W. (paper), Methods of Studying the Concentration and Composition of the Soil Solution; see, Soil Solution, Methods of, etc., 209-232

Phosphate rock for cranberries, 185-188 Plant growth, effect of,

borax upon, 79-131

hydrogen-ion concentration of nutrient solutions on, 69-77

on availability of rock phosphate, with and without presence of organic matter, 29-38

Plants, relation of feeding power of, to utilization of rock phosphate, 32-38

Poison ivy, eradication of, with common rock salt, 457-470

Popillia japonica-

hot water treatment for, 63-68 soil treatment for, 43-61

Potassium in Soils, The Use of Silica Crucibles for the Determination of (paper), J. S. Jones and J. C. Reeder, 419-432 experimental, 419-421

introduction, 419

modified procedure, 426-429

results from controlled fusions, 421-426 Smith silica crucibles, 430-432

summary and conclusions, 432

Potatoes, effect of borax upon growth of, 84-91

Prince, A. L., Lipman, J. G., Blair, A. W., and (paper), The Influence of Varying Amounts of Sulfur in the Soil on Crop Yields, Hydrogen-ion Concentration, Lime Requirements and Nitrate Formation; see, Sulfur in the Soil, etc., 197-207

Productivity of soil correlation of carbonnitrogen ratio with, 491-495

Rate of solution of anions in soil extracts, 273-283

Red clover, nitrogen in tops and roots of, in relation to growth conditions, 375-382, 389-396

Reed, J. W. (paper), Practical Significance of the Organic Carbon-Nitrogen Ratio in Soils; see, Carbon-Nitrogen Ratio, etc., 491-495

Reeder, J. C., Jones, J. S. and (paper), The Use of Silica Crucibles for the Determination of Potassium in Soils, 419-432

Reid, F. R., Skinner, J. J., and (paper), Nutrient Requirements of Clover and Wheat in Solution Cultures, 287-299

Roadsides, cleaning of, with common rock salt, 457-470

Rock phosphate-

direct feeding of plants on, 32-38

effect of organic extracts on solubility of, 27-29

Utilization of, The Relation of Organic Matter and the Feeding Power of Plants to the (paper), F. C. Bauer, 21-41

experimental, 23-38 historical, 21-23 introduction, 21 summary, 38

Rossi, Giacomo (paper), Preliminary Note on the Microbiology of the Soil and the Possible Existence therein of Invisible Germs; see, Soil, Preliminary Note, etc., 409-412

Rudolfs, W. (three papers), Experiments with Common Rock Salt; see Salt, Common Rock, etc., 449-474

I. Effect on Asparagus, 449-474

II. Eradication of Weeds and Cleaning of Roadsides with Salt, 457-470

III. After-effects of Salt, 471-474

Salt, Common Rock, Experiments with, I, II and III (three papers), W. Rudolfs, 449-474

I. Effect on asparagus, 449-474 earlier experiments, 449-474 experimental, 450-454 summary, 454-455

II. Eradication of Weeds and Cleaning Roadsides with Salt, 457-470 experiments in 1919, 458-462 experiments in 1920, 462-469 introduction, 457-458 summary and conclusions, 469-470

III. After-effects of salt, 471-474 conclusions, 474

Savannah cranberry land, fertilizers for, 183-196

Seasonal variation, effect of, on nitrification, 310-320

Silica crucibles, use of, in potash determinations, 419-432

Skinner, J. J., and Reid, F. R. (paper), Nutrient Requirements of Clover and Wheat in Solution Cultures, 287-299

Sodium chloride—
as a fertilizer, 471–474
cleaning roadsides with, 457–470
effect of, on asparagus, 449–455
eradication of weeds by, 457–470
killing poison ivy with, 457–470
killing stumps with, 471–474

Sodium ethyl xanthate, injury of, to plants in soil treatment, 45-56

Sodium sulfocarbonate, injury of, to plants in soil treatment, 45-56

Solubility of anions in alkali soils, 261–285 Soluble non-protein nitrogen, influence of organic decomposition on, 142–143

Solution cultures, nutrient requirements of clover and wheat in, 287-299 Soil-

Acidity and Bacterial Activity (paper), R. E. Stephenson, 133-144 acidity results, 138-141 ammonification, 135-136 discussion, 143 historical, 134 introduction, 133 nitrification, 137-138 plan of experiment, 134-135 residual carbonates, 141-142 soluble, non-protein nitrogen, 142-143 summary, 144

depths, nitrification at various, 339-341 extracts, effect of ratio of soil to water, 266-273

time of shaking, 263–265 invisible germs in the, 409–412 reaction—

control of, by Thiobacillus thiooxidans, 475-489

effect of gypsum on, 433-448

The Effect of Organic Matter on: II, (paper), R. E. Stephenson, 145-162 ammonification, 145 buffering in soils, 153-156

discussion, 152, 161 hydrogen-ion concentration, 151–152 introduction, 145

lime requirement, 145-150 loss of bases by soil, 160-161 nature of soil acidity, 156-158 nitrification, 147-148 residual carbonates, 150-151

source of organic and mineral acids, 158-159

summary, 152-153

solution-

decolorization of, with aluminum hydrate for colorimetric nitrate determination, 413-417

Methods of Studying the Concentration and Composition of the (paper), F. W. Parker, 209-232

introduction, 209-211 displacement method, 211

comparison with water extraction,

composition of solution, 215 concentration of solution, 214 different liquids used, 212 discussion, 221 influence of moisture content, 216

procedure, 211 freezing-point method, 221

comparison with displacement, 222

depression at moisture equivalent, 222

depression by finely divided material, 224

discussion, 229

effect of solids vs. solute, 226 introduction, 221

summary, 230-231

relation between toxicity and concentration of, 163-181

water-extraction method of studying, 218-220

sterilization of, effect on nitrogen fixation, 365-407

treatment-

for *Popillia japonica*, 43-61, 63-68 influence of adsorption in, 50-56

Soils-

cranberry, types of, 184

South African, nitrification in, 301-363

Two Wisconsin, relation of type of, to nitrogen fixation, 365-407

Stallings, J. H., Brown, P. E., and (paper), Inoculated Legumes as Nitrogenous Fertilizers; see, Legumes, Inoculated, etc., 365-407

Stephenson, R. E. (paper)-

Soil Acidity and Bacterial Activity; see, Soil Acidity, etc., 133-144

The Effect of Organic Matter on Soil Reaction. II; see Soil Reaction, etc., 145-162

Straw, effect of, on soil bacteria, 233-259 Stumps, use of salt for killing, 471-474 Sulfur—

in the Soil, The Influence of Varying Amounts of, on Crop Yields, Hydrogenion Concentration, Lime Requirement and Nitrate Formation (paper), J. G. Lipman, A. L. Prince, and A. W. Blair, 197-207

hydrogen-ion concentration, 199–201 introduction, 197–199 lime requirement, 201–203 nitrate determinations, 203–206 summary, 206–207 The Oxidation of, by Soil Microörganisms: I (paper), J. G. Lipman, S. A. Waksman and J. S. Joffe, 475-489 course of oxidation, 481-487 description, 487 importance of organism, 488-489 introduction, 475-476 isolation, 476-477 methods of analysis, 447-481 preliminary media, 447

Toxicity-

of Soluble Salts, The Rôle of Osmotic Pressure in the (paper), J. E. Greaves and Yeppa Lund, 163-181 ammonification, 173-176 introduction, 163-165 method of investigation, 166-173 nitrification, 176-178 summary, 179-180 theories as to toxicity, 165-166 theories of, 165-166

Thiobacillus thiooxidans, action of, on sulfur in soil, 475-489

Thompson, J. W., Leach, B. R., and (paper), Experiments in the Treatment of Balled Earth about the Roots of Coniferous Plants for the Control of Japanese Beetle Larvae; see, Japanese Beetle Larvae, etc., 43-61

Waksman, S. A., Lipman, J. G., and Joffe, J. S. (paper), The Oxidation of Sulfur by Soil Microörganisms: I; see Sulfur, The Oxidation of, etc., 475–489

Water extract, colored, colorimetric determination of soil nitrates in, 413-417

Water extraction method of studying soil solution, 218-220

Weeds, eradication of, with common rock salt, 457-470

Whale manure, nitrification of, 342-343
Wheat—

effect of hydrogen-ion concentration of nutrient solution on growth and chlorosis of, 69-77

nutrient requirements of, in solution cultures, 287-299